I CLAIM:

1. A laser projector comprising:

laser apparatus for projecting a picture beam that includes visible laser light of wavelength about six hundred thirty-five (635) nanometers or longer; and

a reflective liquid-crystal light valve for modulating the beam with a desired image.

2. The projector of claim 1, wherein:

light that appears red in the beam comprises substantially only said laser light of wavelength about 635 nanometers or longer.

3. The projector of claim 1, wherein:

said apparatus projects a beam of wavelength between about 635 and 650 nanometers.

4. The projector of claim 1, wherein:

said apparatus projects a beam of wavelength about 647 nanometers.

5. The projector of claim 1, wherein:

the image is a moving picture.

6. The projector of claim 1, further comprising:

further laser apparatus for projecting one or more picture beams that include green and blue laser light; and

wherein the laser light of wavelength about 635 nanometers or longer mixes with the green and blue laser light to provide substantially pure neutral colors including pure white and pure black.

7. The projector of claim 6, wherein:

the further laser apparatus projects substantially cyan light with the blue or green light, or both.

8. The projector of claim 7, wherein:

wherein the laser light tends to generate visible speckle when used to form a picture on a projection medium; and

further comprising means for at least partly suppressing visible speckle in such a picture;

said suppressing means comprising:

means for displacing the beam during its projection;

said light of wavelength about 635 nanometers or longer; and

said cyan light.

9. The projector of claim 6, wherein:

wherein the laser light tends to generate visible speckle when used to form a picture on a projection medium; and

further comprising means for at least partly suppressing visible speckle in such a picture;

said suppressing means comprising:

means for displacing the beam during its projection; and

said light of wavelength about 635 nanometers or longer.

10. The projector of claim 6, further comprising:

means for receiving high-bandwidth red, green and blue computer-monitor signals from a computer;

wherein the projector serves as a high-color-fidelity computer monitor.

11. The projector of claim 6, wherein:

the liquid-crystal light valve is not controlled by light derived from traditional broadcast video signals.

12. The projector of claim 11, wherein the liquid-crystal light valve is controlled by light or control signals applied to the valve by writing onto a control stage of the valve:

a vector, bitmap or other computer file scanned from an image or generated in a computer, or

amplitude-modulated laser-diode illumination swept two-dimensionally across the control stage, or

images from a small transmissive liquid-crystal display modulator, in turn written by signals not derived from traditional broadcast video signals, or

other entire frames without interlace, or

motion-picture film color separations, or

a still image from a slide or overhead-projection transparency, or a color separation made therefrom, or

a live image optically coupled, without electronic intermediary, to the control stage.

13. The projector of claim 6, wherein:

the liquid-crystal light valve is controlled by light substantially derived from a type of traditional broadcast video signals; and

substantially no color correction or gamma adjustment is applied to remove effects of using said 635-nanometer or longer-wavelength laser light instead of broadcast video standard red.

14. The projector of claim 6, wherein:

the first-mentioned laser apparatus and the further laser apparatus, considered together, comprise one or more lasers; and

every laser in the first-mentioned laser apparatus and the further laser apparatus is exclusively a solid-state laser.

15. The projector of claim 6, wherein:

the first-mentioned laser apparatus and the further laser apparatus, considered together, comprise one or more lasers; and

every laser in the first-mentioned laser apparatus and the further laser apparatus is exclusively a gas laser.

16. The projector of claim 1, further comprising:

further laser apparatus for projecting one or more picture beams that include green and blue laser light; wherein:

the proportions of light power of the about 635-nanometer or longer-wavelength laser light, the green laser light and the blue laser light are roughly eight to six to five (8:6:5).

17. The projector of claim 1:

wherein the laser light tends to generate visible speckle when used to form a picture on a projection medium; and

further comprising means for at least partly suppressing visible speckle in such a picture;

said suppressing means comprising means for displacing the beam during its projection.

18. The projector of claim 1, wherein:

said suppressing means further comprise said light of wavelength about 635 nanometers or longer.

19. The projector of claim 18:

wherein the liquid-crystal light valve has a beam-modulation stage for impressing the desired image onto the beam, and a control stage to control said impressing; and further comprising:

means for writing an image incrementally onto successive portions of the control stage; and

means for directing the beam onto successive selected portions of the modulation stage, and for generally synchronizing the directing means with the image-writing means.

20. The projector of claim 1:

wherein the liquid-crystal light valve has a beam-modulation stage for impressing the desired image onto the beam, and a control stage to control said impressing; and further comprising:

means for writing an image incrementally onto successive portions of the control stage; and

means for directing the beam onto successive selected portions of the modulation stage, and for generally synchronizing the directing means with the image-writing means.

21. The projector of claim 1, particularly for use in forming an image on an irregular projection medium having portions at distinctly different distances from the projector:

wherein the liquid-crystal light valve operates by introducing at least partial disruption of the laser-light coherence; and comprising:

means for projecting the picture beam onto such irregular projection medium to form an image that appears substantially sharp on said portions of distinctly different distances, notwithstanding said at least partial disruption of coherence.

22. A laser projector comprising:

laser apparatus for projecting along a path a picture beam that includes laser light which tends to generate visible speckle when used to form a picture on a projection medium; and

means for at least partly suppressing visible speckle in such a picture; and

the suppressing means comprising means for displacing the path during projection of the beam.

23. The projector of claim 22, further comprising:

a liquid-crystal light valve having a beam-modulation stage for impressing an image onto the beam; and wherein:

the displacing means scan the beam over the beam-modulation stage during said projection.

24. The projector of claim 23, wherein:

the displacing means scan the beam over the beam-modulation stage by mechanically or electrooptically deflecting the beam path rotationally.

25. The projector of claim 24, wherein:

the directing means comprise an optical deflecting element mounted for mechanical rotation.

26. The projector of claim 25, wherein:

the deflecting element comprises a mirror mounted on a galvanometer or motor.

27. The projector of claim 26, wherein:

the mirror is mounted for rotation about an axis substantially in a reflective surface of the mirror.

28. The projector of claim 23:

the light valve also having a control stage to control said impressing; and further comprising:

means for writing an image incrementally onto successive portions of the control stage; and

means for controlling the displacing means to direct the beam onto successive selected portions of the modulation stage, and to generally synchronize the beam with the image-writing means.

29. The projector of claim 28, wherein:

the control stage is a photosensitive stage that receives an incrementally written optical image.

30. The projector of claim 28, wherein:

the control stage comprises an electrode matrix that receives incrementally written electrical voltages.

31. The projector of claim 23, particularly for use in forming an image on an irregular projection medium having portions at distinctly different distances from the projector, wherein:

the displacing means are substantially nondiffusing; and

the liquid-crystal light valve operates by introducing at least partial disruption of the laser-light coherence; and further comprising:

means for projecting the picture beam onto such irregular projection medium to form an image that appears substantially sharp on said portions of distinctly different distances, notwithstanding said at least partial disruption of coherence.

32. The projector of claim 22, wherein:

the displacing means are substantially lossless, to within one percent of beam intensity.

33. The projector of claim 22:

further comprising beam-expansion means; and

wherein the displacing means and beam-expansion means cooperate to achieve a net gain in light-energy efficiency.

34. The projector of claim 33, wherein:

the gain in efficiency approaches roughly fifty-six percent, in comparison with masking off original circular edges of the laser beam.

35. The projector of claim 33, wherein:

for a screen aspect ratio of four to three, the gain in efficiency approaches roughly sixty-four percent, in comparison with masking off original circular edges of the laser beam.

36. The projector of claim 33, wherein:

for a screen aspect ratio of sixteen to nine, the gain in efficiency approaches roughly eighty-five percent, in comparison with masking off original circular edges of the laser beam.

37. The projector of claim 33, wherein:

the displacing means and beam-expansion means also cooperate to substantially eliminate initial nonuniformity of brightness in the beam.

38. The projector of claim 22, wherein:

the laser apparatus comprises one or more lasers; and

every laser in the laser apparatus is exclusively a solid-state laser.

39. The projector of claim 22, wherein:

the laser apparatus comprises optical means for shaping the picture beam to a shallow cross-section; and

the displacing means also shift the picture beam on the projection medium, during said projection.

40. The projector of claim 39, wherein the optical means are selected from the group consisting of:

plural lenses in series for adjusting the beam dimension in two substantially perpendicular directions; and

a curved mirror that forms part of the displacing means.

41. The projector of claim 39, wherein:

the displacing means comprise a curved mirror that shapes the picture beam to a shallow cross-section; and

said curved mirror is mounted in a galvanometer movement or motor, to scan the shaped beam over said modulation stage.

42. A laser projector comprising:

laser apparatus for projecting a picture beam that includes exclusively laser light;

a liquid-crystal light valve having a beam-modulation stage for impressing an image onto the exclusively laser-light beam, and having a control stage, distinct from the beam-modulation stage, to control said impressing;

means for writing an image incrementally onto successive generally slot-shaped portions of the control stage; and

means for directing the exclusively laser-light beam onto successive selected generally slot-shaped portions of the modulation stage, and for generally synchronizing the exclusively laser-light beam with the image-writing means.

43. The projector of claim 42, wherein:

the laser apparatus initially projects the exclusively laser-light picture beam having substantially all rays substantially parallel to a common optical axis, with substantially no ray crossing the optical axis or otherwise passing through the center of any aperture stop;

wherein the projector therefore has no telecentric zone; and

the exclusively laser-light picture beam is not focused at or near the directing means or the modulation stage, or elsewhere within the laser projector.

44. The projector of claim 43, wherein:

the liquid-crystal light valve includes a substantially distinct spatial portion for modulation of each distinct spatial portion of the exclusively laser-light beam, respectively.

45. The projector of claim 44, wherein:

the projected beam has a cross-section that is substantially uniform in intensity rather than having a Gaussian intensity distribution.

46. The projector of claim 45, wherein:

substantially the entire cross-section of the exclusively laser-light beam, with negligible masking, is directed onto said successive selected portions of the modulation stage.

47. The projector of claim 42, wherein:

substantially each control-stage portion has a substantially corresponding modulation-stage portion; and

the directing-and-synchronizing means generally synchronize selection of modulation-stage portions with writing at corresponding successive control-stage portions, subject to a delay generally equal to rise time in the modulation stage.

48. The projector of claim 42, wherein:

the directing means comprise an optical deflecting element mounted for rotation.

49. The projector of claim 48, wherein:

the deflecting element comprises a mirror mounted on a galvanometer or motor.

50. The projector of claim 48, wherein:

the deflecting element comprises a mirror mounted on a rotating disc.

51. The projector of claim 50, wherein:

the deflecting element comprises multiple mirrors mounted about a rotating disc.

52. The projector of claim 42, wherein:

the directing means comprise a mechanically rotated reflective or refractive element; and

all dimensions of the exclusively laser-light beam at the light valve are substantially unaffected by dispersion in the directing means, regardless of whether said element is reflective or refractive.

53. The projector of claim 42, wherein:

the control stage is a photosensitive stage that receives an incrementally written optical image.

54. The projector of claim 42, wherein:

the laser apparatus comprises one or more lasers; and

every laser in the laser apparatus is exclusively a solid-state laser.

55. The projector of claim 42, wherein:

the laser apparatus comprises optical means for shaping the picture beam to a shallow cross-section; and

the directing means also shift the picture beam on the projection medium, during said projection.

56. The projector of claim 55, wherein the optical means are selected from the group consisting of:

plural lenses in series for adjusting the beam dimension in two substantially perpendicular directions; and

a curved mirror that forms part of the directing means.

57. The projector of claim 42, wherein:

the directing means comprise a curved mirror that shapes the picture beam to a shallow cross-section; and

said curved mirror is mounted in a galvanometer movement or motor, to scan the shaped beam across said modulation stage.

58. The projector of claim 42, wherein:

the directing means comprise a curved mirror that shapes the picture beam to a shallow cross-section; and

said curved mirror is mounted to a rotating disc for scanning the shaped beam across said modulation stage.

59. The projector of claim 42, further comprising:

means for reflecting the beam from the directing means into the beam-modulation stage and for transmitting the beam, after return from the beam-modulation stage, to form a picture on a projection medium; and wherein:

the laser apparatus is generally disposed on a first level;

the light valve, writing means, and reflecting-and-transmitting means are generally disposed on a second level above or below the first level; and

the directing means also transfer the beam from the first level to the second level.

60. The projector of claim 59, wherein:

the directing means turn the beam from a path generally associated with the first level to propagate in a direction generally perpendicular to that path, toward the second level.

61. The projector of claim 42, wherein:

the beam follows a first, generally rectilinear path from a laser source to the directing means;

the beam follows a second, generally rectilinear path from the directing means toward the beam-modulation stage; and

the directing means also turn the beam from the first path into the second path.

62. The projector of claim 61, wherein:

the first and second paths are generally mutually perpendicular.

63. A laser projector comprising:

laser apparatus for forming a picture beam that includes laser light;

said laser apparatus producing an initially substantially circular laser-light beam subject to nonuniform illumination;

means for transmitting a beam out of the projector for viewing by an audience as images on a substantially rectangular viewing screen; and

means for forming an illuminated image on the substantially rectangular viewing screen by using the circular laser-light beam without masking off significant fractions of the laser-light beam;

said image-forming means comprising:

means for reshaping the initially circular laser-light beam to a shallow, wide laser-light beam, and

means for scanning the shallow, wide laser-light beam over the screen.

64. The projector of claim 63, further comprising:

means for minimizing the influence of nonuniformity of illumination in the initially substantially circular laser-light beam;

said minimizing means comprising said reshaping and scanning means;

wherein the reshaping and scanning means tend to cause said nonuniformity to average out.

65. The projector of claim 63, wherein:

the reshaping means introduce additional illumination nonuniformity along the width of the shallow, wide laser-light beam; and

the image-forming means further comprise means for compensating for the additional illumination nonuniformity.

66. A laser projection system for forming an image on an irregular projection medium having portions at distinctly differing distances from the projector; said system comprising:

laser apparatus for projecting a picture beam that includes laser light;

a liquid-crystal light valve for impressing an image onto the beam; and

means for projecting the beam from the light valve, with said impressed image, onto such irregular projection medium.

67. The system of claim 66, wherein:

the irregular projection medium is selected from the group consisting of:

an interior of a dome, or other building having internal surfaces that are not generally normal to a projection direction,

an exterior of a dome, sculpture, monument, or other structure having external surfaces that are not generally normal to a projection direction,

a waterfall,

a water fountain,

fog or a cloud,

ice,

a scrim in front of a curtain or screen,

a plurality of scrims in optical series,

one or more trees,

grass, vines or other foliage,

a hillside or other landscape, or other receding surface, and

an array of people or other animals or other discrete objects, or combinations thereof, at diverse distances from the projecting means.

68. The system of claim 67, further comprising:

such irregular projection medium.

69. The system of claim 66, further comprising:

such irregular projection medium.

70. The system of claim 66, wherein:

the liquid-crystal light valve operates by partial disruption of laser-light coherence in the beam; and

notwithstanding said partial disruption of coherence, the image appears sharp on said projection-medium portions of differing distances.

71. The system of claim 70, wherein:

the image appears substantially evenly illuminated, except where light is distributed over a receding surface.

72. The system of claim 66, wherein:

the projection medium comprises a curved screen or dome;

the laser apparatus comprises means for shaping the beam to have a shallow cross-section, and means for scanning the beam on such irregular projection medium; and

the beam at such irregular projection medium is substantially uniform in distribution across its cross-section.

73. The system of claim 66, wherein:

the laser apparatus comprises one or more lasers; and

every laser in the laser apparatus is exclusively a solid-state laser.

74. A laser projector comprising:

a light source for forming a picture beam;

a modulator for impressing a latent image onto the picture beam;

a polarization analyzing cube for receiving light from the modulator and developing the image; and

means for projecting the beam, with said developed image, for viewing by an audience.

75. The system of claim 74, wherein:

the cube also supplies the picture beam to the modulator.

76. The system of claim 75, wherein:

the light source comprises a laser.

77. The system of claim 76, wherein:

antireflective coatings are formed on three cube faces through which the beam passes to and from the modulator.

78. The system of claim 77, wherein:

the cube has six faces, including three through which the beam passes to and from the modulator and three others; and

light absorbers are at one or more of said other faces.

79. The system of claim 74, wherein:

the light source comprises a laser.